Closeout Report

on the

Department of Energy
Review Committee

for the

Technical, Cost, Schedule, and
Management Review

of the

NEUTRINOS at the MAIN INJECTOR (NuMI) PROJECT

November 14, 2003

Department of Energy Review
of the
Neutrinos at the Main Injector (NuMI) Project
November 13-14, 2003

REVIEW COMMITTEE PARTICIPANTS

Department of Energy

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Department of Energy Review
of the
Neutrinos at the Main Injector (NuMI) Project
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REPORT OUTLINE/WRITING ASSIGNMENTS

Executive Summary ..... Debenham*/Tkaczyk
1. Introduction ..... Debenham*/Lutha
2. NuMI Technical Components (WBS 1.1) ..... Cutler*/Ecklund
3. Civil Construction (WBS 1.2) ..... Webster*
4. MINOS Detectors (WBS 2) ..... Imlay*
5. Installation ..... Gerig*
6. Commissioning ..... Ecklund*
7. Environment, Safety and Health ..... Lutha*
8. Cost ..... Tkaczyk*
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*Lead

Department of Energy
Review of the NuMI Project
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CHARGE to the COMMITTEE

This is the twelfth Department of Energy (DOE) review of the Neutrinos at the Main Injector (NuMI) project. The review, which is being requested by the Associate Director for the Office of High Energy Physics, will consider the technical, cost, schedule, and management aspects of the project. The last review was held in May 2003.

A written report on the review is due to the Associate Director by December 19, 2003. The review committee is asked to address in the report the following specific points.

1. Assess the project's response to the comments and recommendations of the last review committee.

   a) How has laboratory management responded to concerns raised at previous reviews about the adequacy of resources for commissioning the NuMI beam for CD-4, in the context of the ongoing collider program?

   b) Assess the laboratory's plans and schedule for commissioning the NuMI beam for initial MINOS physics.

2. The remaining active elements of the project are NuMI technical components, civil construction, the MINOS detectors, and installation. For each of these:

   a) Assess the progress made since the last review, and the status of the DOE and project milestones.

   b) Identify any changes made to the project baseline (technical, cost, and schedule) since the last review, and discuss their impact.

   c) What remains to be done in this area to complete the project? Evaluate the project's estimate of the cost and schedule to complete this work.

Roy Cutler, SNS/ORNL
Stan Eckland, SLAC
November 14, 2003

2. NuMI Technical Components (WBS 1.1)

2.1 Findings

The work in WBS 1.1, NuMI Technical Components is transitioning from construction of components, which is largely completed, to installation activities. Excellent progress has been made throughout this WBS element, with the completion of many technical systems. Major installation activities have taken place in the Main Injector during a recent shutdown and installation has started in the NuMI target area. No schedule slippage occurred in the last six months. Technical changes have been minimal. Listed below are some of the key technical achievements of the last six months:

- Large magnet installation complete in MI-60 and Extraction enclosure (28 total – Lambertsons, C-magnet, EPB dipoles, B2 dipoles, 3Q quadrupoles). (1.1.1)
- Testing of horn 2 and fabrication and testing of horn 1 were completed. (1.1.2)
- Horn 1 module assembly completed. (1.1.2)
- Transmission line design and drawings were completed. (1.1.3)
- All magnet power supply work is complete in MI_60N and MI_62. (1.1.3)
- Updated the Hadron Absorber installation plan to take place concurrent with the MINOS Near Detector installation. (1.1.4)
- All the muon chambers have been constructed and 15/32 (5 spares) have been tested and calibrated. (1.1.5)
- Marked positions of the proton beam line and magnet stands in the MI extraction and NuMI stub areas, and made a rough alignment of the magnets in the MI extraction region. (1.1.6)
- Instrumentation and motor starters for the RAW skids were purchased, received and installed and piping for the RAW skids was completed. (1.1.7)
- New interlock hardware establishing boundary between MI and NuMI radiation safety system areas and ~50% of the cables were installed. (1.1.8)

The two recommendations of the May2003 DOE Review Committee were addressed by the NuMI Design Team. They were to consider installing the Lambertson magnets in the 2003 shutdown (done) and hold an outside review of the end cap design and installation and testing plans (done). The Main Injector has since been operated with the Lambertson's installed (but not powered) and no ill effects on Main Injector performance have been observed.

The planned installation of NuMI technical components in the Main Injector went as scheduled and there were sufficient resources to complete this task in a timely manner. The NuMI technical components task also had the necessary design resources to

complete all needed designs. In general, there has been no schedule slippage of any of the technical components with the exception of the profile monitors. A recovery plan for these is in place with no overall schedule impact.

For some of the quadrupole magnets, it was found that there was insufficient cooling to operate the magnets at the required fields with dc power supplies as planned. Modifications to either the magnet cooling or to use ramped power supplies are planned to solve this problem.

WBS 1.1 has a budget of $26.8 million, with $19.2 million spent so far and an estimate to complete (ETC) of $7.8 million. Of this amount, 25% is for purchases, 39% is for Fermi labor, and 36% is for Davis Bacon Labor. A total of $4.1 million has been spent in the last half of FY03. Change requests of $666K were approved in the last 6 months, largely for additional design labor for technical components. These were partially offset by savings of $116K from optimizing absorber and near detector installation for a net contingency usage of $550K. An additional $800K of Change Requests is believed to be likely.

Work planned for the next six months includes the completion of all technical components (except for the profile monitors) and half of the remaining installation work in the Target Hall and Absorber region. About $4 million of work is planned.

2.2 Comments

The committee is pleased with the progress in NuMI Technical Components and the transition to installation activities has been smooth. Problems with the quadrupole magnet cooling, while of concern, have an identified solution that has no schedule and minimal cost impact. Similarly, the profile monitor delay will have no overall impact on schedule. Overall, an excellent job.

As in the previous six months (11/02 – 5/03), no schedule slippage has occurred in the last six months. Sufficient resources have been made available to the project by Fermi management.

Contingency usage in this WBS is in agreement with management projections (~20% of the cost to go) and appears reasonable as the work to go does not have great technical or cost risk.

The review committee is satisfied with the response to our recommendations and believes that there are few areas of technical risk remaining in this WBS element.

2.3 Recommendations

None!

3. Civil Construction (WBS 1.2)

3.1 Tunnel and Halls

3.1.1 Findings and Comments

Fermilab has continued efforts to resolve open requests for equitable adjustments on the Tunnel and Halls subcontract. Negotiations have proceeded and seven Dispute Resolution Board (DRB) hearings have been held. DRB hearings have been scheduled for FY2004 and into FY2005 by mutual agreement of both Fermilab and the Tunnel and Halls subcontractor.

3.2 Surface Buildings and Outfitting

3.2.1 Findings and Comments

The scope of the Service Buildings and Outfitting (SB&O) subcontract includes the construction of the Target Service Building and the MINOS Service Building, outfitting of the underground NuMI facility at Fermilab (which includes installation of the conventional mechanical and electrical systems), and completion of the pit liner in the Target Hall.

At the last review the SB&O subcontract was approximately 40% complete. As of this review the SB&O subcontract is 83% complete. Major accomplishments include beneficial occupancy of the Target Service Building and the Target and Carrier Tunnel areas and the completion of the MINOS Service Building shell. Installation of major systems in the building is well underway as are the installation of electrical and mechanical systems in the MINOS and Absorber area tunnels.

The SB&O subcontractor received a schedule extension of 32 calendar days on the Beneficial Occupancy of the Target Site and a schedule extension of 50 days on the Beneficial Occupancy of the MINOS Site. Beneficial Occupancy of the Target Site occurred on 10/20/03 and Beneficial Occupancy of the MINOS Site is scheduled for 1/31/04. Beneficial Occupancy of the MINOS Site is no longer on the project critical path and there remains 4 months of positive float on the DOE milestone.

The contract value is approximately $20M, up $2M from the time of the award. This includes $1.5M of changes and $0.5M of work budgeted elsewhere and moved into this contract.

There have been no unresolved contractual issues on this subcontract. A DRB is contractually stipulated if either party desires. Neither party has requested the use of the DRB nor is it anticipated that the DBR will be required.

One open issue appears to be the selection of the final access road into the MINOS Site. A decision is required on whether to building the originally planned road past the Lederman Center or to upgrade the temporary construction road.

Fermilab is doing an excellent job of managing the SB&O subcontract and is well positioned to complete this work without significant difficulty.

3.3 Recommendation

1. Continue the good work.

4. MINOS
11/14/2003
4.1 Findings

DOE Milestone L-1-8 (Far detector complete and tested) was completed July 9, 2003. The Far Detector (FD) now routinely collects cosmic ray data and is fully supported by the Operations Budget.

There has been good progress on production of front-end electronics which should be complete well before the end of the Near Detector (ND) plane installation. Assembly and check out are in general proceeding smoothly. The Minder crates have a mechanical problem with the card guide which the supplier has tried but so far failed to fix. Several crates have been fixed at ANL and, if necessary, all the crates could be fixed there in several weeks for modest sums. The successful calibration run with CALDET in a test beam at CERN provided a valuable check of the complete system. Rack assembly in New Muon Lab is now 70% complete and at the present rate of assembly would finish sometime in January 2004. Installation of the ND in the MINOS Hall is currently scheduled to begin in February 2004, proceed at a rate of two planes per day and finish nine months later. MINOS conducted an installation review at their collaboration meeting in September.

Six Level 3 Milestones were forecast for MINOS during the six months since the last review. Five of these were accomplished. They have completed WBS 2.1 (Magnets, Steel and Coils), WBS 2.2 (Scintillator Detector Fabrication) and WBS 2.4 (Far Detector Installation). The current estimate at completion is approximately $46,600K, about $1,000K under the present baseline. The contingency covers the remaining tasks by about a factor of 2 which seems more than adequate.

4.2 Comments

The recommendation from the May 2003 DOE Review has been addressed. Arrangements have been made that will allow them to alternate as needed between crane usage in the shaft for absorber installation and for ND installation. This will allow ND installation to start slightly earlier than previously scheduled and provide greater flexibility for dealing with unanticipated problems or interruptions. If necessary, they would add a second shift for ND installation at a cost of as much as several hundred thousand dollars.

CALDET provided an important test of the electronic system but it did not use the final assembled racks that will be used with the ND. MINOS is now planning to conduct a test of eight planes with the final system in the New Muon Lab before installation. It is very desirable to detect any problems before installation begins and thus we strongly endorse this test if it can be accomplished within the schedule.

4.3 Recommendations

None

5. INSTALLATION

The project has successfully undergone a thorough test of installation readiness during the recent Main Injector shutdown. All of the lambertsons and stub magnets were installed, and preparation work for future installation was performed. The plans for installation are well thought out, and are being well implemented.

5.1 Findings

This section discusses the overall installation effort at the Fermilab site.

Installations activities are confined to three identified areas:

- Main Injector
- Pre-Target & Target Halls (MI-65)
- Absorber & MINOS

As noted above, the 2003 shutdown of the Main Injector (MI) provided a seven week opportunity to install NuMI hardware in the Main Injector enclosure. The project was able complete a substantial portion of the total installation work in the MI enclosure.

Beneficial Occupancy of the Pre-Target and Target Hall was obtained in October. Technicians who had worked in the Main Injector during the shutdown are now beginning installation work in the Target Hall.

Beneficial Occupancy of the MINOS Detector area is expected on January 31, 2004. Installation work appears to be well planned, and lessons learned from MI and Target Hall installation is being incorporated.

The critical path is now going through Target Hall installation. However, there is adequate float and resources to deal with this situation. Shielding block installation will be done using two shifts beginning in December 2003.

5.2 Comments

The recommendation from the May 2003 DOE review, the laboratory's response and, this committee's comments are given below.

Consider naming one person to lead the installation effort in the Target area similar to Cat James in the MINOS area. The project did consider this approach to installation management, but chose to implement a somewhat different scheme. Each of the three areas is assigned a floor manager (Tom Prosapio in the Target area) and in the case of the Target area, a deputy floor manager as well. Task managers report to the floor managers. Level 3 managers are involved in weekly planning meetings, providing technical and project management oversight. The committee feels that this arrangement is working well and is adequate to successfully complete installation.

The project has continued to implement recommendations from the Director's review of the Installation Plan, which was held just prior to the last DOE review. At that DOE review, the project was encouraged to follow through with these, recommendations and we were shown numerous examples of these activities.

The project is positioned to effectively use the short Main Injector shutdowns that will occur during the next ten months to continue installation, and to complete MI enclosure installation of NuMI equipment in the summer shutdown in 2004.

The SB&O subcontract is going well, and beneficial occupancy of the MINOS area is expected on January 31, 2004. Detector installation will be done by laboratory technicians, largely those who have been involved in assembly of the detector. The absorber and associated equipment will be installed by Time & Material labor. Thus there is no overlap of installation resources with activities in the other two areas.

The April 2003 Director's review committee expressed concern that the Beams Division did not have adequate staff to both support the NuMI installation and do the required Run II work. The work done during the 2003 shutdown demonstrates that the project and the Beams Division have resolved this problem and accomplished the work needed for both. Vigilance will be needed to maintain this cooperation during Target Hall installation.

In a risk analysis exercise, contingency has been allotted to installation, sufficient to cover conceivable problems.

5.3 Recommendations

None

Stan Ecklund

6. COMMISSIONING

6.1 Findings

The Committee met with the project managers and the Beams Division managers to discuss preparations for NuMI commissioning. Since the May 2003 DOE review, the project has installed components in the Main Injector (MI) during the 2003 summer down, and developed a commissioning plan for the MI for NuMI beam. The Main Injector Department has a key NuMI staff member as Deputy Department Head. As noted at the last review, the MI has demonstrated good performance with 6 batches giving 2.3×10^{13} total protons per cycle. This is close to the design 3×10^{13} physics goal for NuMI operation concurrent with antiproton production. The effectiveness of the MI dampers has been demonstrated and a full implementation is to be operational by April 2004. Beam commissioning to NuMI is on schedule to begin Jan. 2005 after critical installation occurs during the 2004 shutdown. The lab has reorganized the Beams Division, moving the Beam Physics personnel into operating groups.

All four recommendations of the May 2003 review have been successfully addressed. The three Lambertson magnets have been installed during the summer 2003 shutdown but can not yet be powered. The beam has successfully run in the MI with the newly installed Lambertsons using an orbit bump as anticipated. Some work remains to smooth the orbit bump and check MI performance when the Lambertsons are energized after the 2004 shutdown.

A list of MI beam studies was presented with dates for scheduled completion. A group of involved people are identified who participate in these studies. Time for studies is based on available time between antiproton stacks. Studies are approved by the Beams Division Associate Head for Accelerators. Studies in the booster are ongoing and driven by the total laboratory proton needs. The commissioning plan dated Oct 2002 continues as the document detailing the NuMI checkout. It delineates three commissioning stages, 1) subsystem checkout, 2) achieving the CD-4 goal of 1×10^{12} protons per pulse (ppp) on target, and 3) commissioning for physics with 2.5×10^{13} ppp on target. In the next 6 months, management plans to hold a commissioning workshop with the parties involved as preparation for the checkout activities.

A plan for shielding the recycler from NuMI extraction dipole magnet fields was presented. A calculation shows an adequate field reduction factor of 55. The design is being

prototyped so a measurement can check the calculation and final production mechanical design remains to be done.

The near detector will be checked out as they are installed in the underground hall. Electronics racks are assembled and tested as completely as feasible on the surface before installation in the hall.

6.2 Comments

Given recent performance of beam in the MI and the plan of studies presented, the physics running with 2.5×10^{13} protons per cycle on target should be achievable. In particular, commissioning to the CD-4 level of 1×10^{13} on target appears under control. A path to higher intensities, greater that 2.5×10^{13} was not shown to the committee. A study by the "Proton Team" (Oct 26, 2003), outlines several possibilities for increasing the intensity of the injector chain. The study is presently under review and a plan will be generated based on physics need and possible upgraded machine performance. NuMI management should consider the impact of commissioning to some higher intensity, (such as 5×10^{13} or operating with a shorter cycle time) consistent with the plan developed for the injector chain. At the next review, the project should discuss the impact of these plans.

Presently booster intensity is limited by residual radiation on components which require maintenance. Booster studies are addressing this with the expectation of allowing operation at higher currents. It is possible that the MI will have similar limitations. A plan to quantify losses is part of the MI studies plan.

Previous reviews have commented, and the Committee agrees, that the task of commissioning the primary transport for CD-4 can be done in the scheduled time of roughly one month. However, the project anticipates, and the committee agrees, that managing conflicts with the ongoing collider program will remain a challenge. In particular the shutdown in 2004 (reported to need eight weeks) is critical for installation and checkout of NuMI extraction components. The 2003 shutdown was very successful and current beam study time is deemed adequate.

While additional manpower has been found for commissioning activities, the plan for the coming year has a sizeable amount to be accomplished in the MI. Additional staff to help with beam studies could well pay off in a more rapid turn on of high intensity beams at the physics

level of 2.5×10^{13}. Involving an operations specialist to a greater extent is also encouraged.

The effect on the MI beam from energized extraction Lambertson magnets should be tested as soon as possible in order to make any corrections without delay.

6.3 Recommendations

None

DOE Review of the NuMI Project

November 14, 2003
Richard Hislop
Jim Lang

7. Environment, Safety and Health

7.1 Findings

NuMI construction contractors have generally improved the quality of their job hazard analysis, coordination of work with other trades and pre-shift coordination/safety briefings since the December 12, 2002 review. Fermilab has also adopted the same job hazards analysis and work coordination practices for its installation activities in the Target area.

The Fermi Area Office and Fermilab NuMI ES&H staff continue to regularly attend pre-shift meetings conducted by RBI and Fermilab. Construction area inspections are conducted by the Fermilab NuMI project management team members, the Fermilab ES&H section and DOE-FAO. The assessment team was able to participate in several of these activities and was satisfied that they were focused and were conducted effectively.

Five of the last six of the safety incidents on the NuMI project occurred to Divane employees. Each of these incidents was due to inattention to detail and failure to effectively plan work. In spite of initial difficulties with their safety program Divane management effectively overcame these problems and had been making an effort to promote an effective safety program. As a whole the craft personnel are very appreciative of Fermilab effort to provide them with a safe work environment and very specifically stated that Fermi is the safest place they have ever worked. However, it is not uncommon in the construction industry to find individuals who are resistive to following safety rules. Divane management has had two recent occasions where they terminated employees unwilling to perform to the safety expectations on the NuMI project. Fermilab NuMI project management was aware of these Divane safety decisions.

7.2 Comments

Work planning and safety observations are key to a successful safety program. The NuMI project has effectively implemented the job hazard analysis and associated work coordination process. However, there is room for improvement of its safety inspection and observation process. Currently it appears that the most frequent NuMI project management site surveillances are conducted by the Deputy Project Manager Civil Construction, the Construction Project Manager, field construction coordinators and the project ESH personnel. There appears to be a heavy reliance on the project ESH personnel to identify and correct field safety concerns.

Contractor key personnel and NuMI management should set aside time each week to walk the jobsite with ESH support to make safety observations and speak with field personnel. This will reinforce to the field personnel management's continuing support and safety expectations. The workforce seeing project management identify unsafe work practices and conditions will lead to greater buy-in to the safety process.

The subcontractor superintendent should be identified as a "key person" in construction contracts. This will enable Fermilab to participate in the selection process of this critical management position.

7.3 Recommendations

1. Conduct weekly joint safety walks with construction contractor "key personnel" and NuMI team members to add "fresh eyes" to evaluation work conditions and take corrective actions as necessary. **Immediately**

2. Retain a consultant to advise DOE-FAO on their construction oversight program. **Immediately**

8. COST

8.1 Findings

On December 21, 2001, the Deputy Secretary approved a Level 0 baseline change which established a new Total Project Cost (TPC) of $171.4 million for the NuMI project. At subsequent DOE reviews, the project presented changes to the baseline that required contingency utilization but left the TPC fixed. At the current review, additional contingency activity was presented, but the TPC still remains unchanged. Table 8-1 provides a summary of the TPC evolution from the December 2001 re-baseline to this current review. Additional cost details can be found in Appendix D.

Table 8-1. Changes to Baseline Cost Estimate (in $K)

WBS	Description	December 2001 Baseline	May 2003 Review	Changes since May 2003 Review	November 2003 Review
1.1	Technical Components	27962	26219	550	26768
1.2	Facility Construction	60493	67059	988	68047
1.3	Project Management	4788	4430	(100)	4330
	Contingency on TEC	15999	11534	(1437)	10097
1.0	**Total Estimated Cost (TEC)**	**109242**	**109242**	**0**	**109242**
2.0	MINOS	38776	42195	212	42407
3.0	Project Support	16109	16377	1	16378
	Contingency on OPC	7315	3628	(213)	3415
	Other Project Cost (OPC)	**62200**	**62200**	**0**	**62200**
	Total Project Cost (TPC)	**171442**	**171442**	**0**	**171442**

Since the May 2003 DOE review, the contingency for the TEC was reduced by $1,437,000. This is primarily due to change orders and budget adjustments to the SB&O contract ($1.0M) and labor cost overruns in the design of technical components ($0.6M). Contingency for OPC decreased by $214,000 due primarily to increases in detector installation costs. A list of the change requests and their descriptions is included in Appendix E.

The project is 92 percent complete (TPC) through September 2003. The remaining contingency for the TPC is $13.5 million, which is 101 percent of the estimate

to complete (ETC). Table 8-2 summarizes the NuMI project contingency.

Table 8-2. Project Contingency Status (in millions of dollars)

	Baseline	ETC	Contingency
TEC	109.2	11.8	10.1
OPC	62.2	1.6	3.4
TPC	171.4	13.4	13.5

8.2 Comments

The contingency remaining is a significant percent of the ETC. However, there are remaining cost risks within the project. The project will incur additional costs if any of the 238 days of float in the schedule (See Section 9) are required for completion. The project has conducted an exercise in risk assessment and management which they discussed at the review. Their conclusion was that the project is manageable within the boundaries of the current cost baseline. The Committee concurs with this conclusion.

9. SCHEDULE and FUNDING

9.1 Findings

The project presented a master schedule and a list of DOE milestones with associated schedule float relative to the project's internal schedule (see Appendix F). Milestone L-1-9 (Start commissioning beam line) is projected to occur on December 28, 2004. This would be followed by the milestone L-0-3 (CD-4: Start of operations) on February 4, 2005. There would be 238 days of float remaining until the baseline CD-4 date of September 30, 2005. This compares to 259 days as presented in the May 2003 DOE review.

Milestone L-2-17 (Complete installation of horn power supply) is forecast for February 6, 2004, which is 208 days ahead of the baseline date. This is four months later than forecast at the last review but is not a critical path item.

Milestone L-2-18 (Target Service Building shell complete) occurred on June 17, 2003. Milestone L-2-11 (Beneficial occupancy of service buildings at Fermilab) is projected for January 31, 2004, 5 weeks later than it was forecasted at the last review. However, this date is 122 days ahead of the baseline schedule date.

For the detectors, Milestone L-1-8 (Far detector complete and tested) occurred on July 9, 2003, 291 days ahead of baseline schedule. Milestone L-2-14 (Near Detector Complete and Tested) is forecast for December 28, 2004, 93 days ahead of the baseline schedule date.

The funding profile for the project (Appendix G) supports the internal schedule.

9.2 Comments

The Committee commends the project for accomplishing DOE and Level 3 milestones since the last review well ahead of the baseline schedule, and sees evidence that this trend will continue. There are no funding issues with the project.

R. Gerig

10. MANAGEMENT

10.1 Findings

The project is being well managed to meet technical scope, cost and schedule baselines. During the last 6 months $15M of progress has been made, with $13M remaining. The majority of this work is installation; most technical components have been delivered.

The successful installation activities in the Main Injector Enclosure during the 2003 shutdown illustrate that management has resolved the issues associated with supporting both the NuMI project and collider needs.

The commissioning plans also indicate that the operational needs of NuMI are well integrated into the Beams Division priorities without significant impact on collider objectives.

The project has a risk evaluation system in place and is keeping it up to date. Various areas are identified where there will likely be cost and/or schedule impacts. These are being closely managed.

Two DOE milestones were met in the last six months (Target Service Building Shell Complete, and Far Detector Complete and Tested)

10.2 Comments

The laboratory has evaluated the overall proton needs of Fermilab for the next several decades. While it is early in the planning process, this sort of long term - strategic planning will benefit NuMI. Progress is being made in addressing NuMI needs in the near term with studies, and improvements being realized in both the Booster and the Main Injector.

As noted in the section on ES&H, there have been several injuries in the last week. The committee feels that management is commitment to safety and is aggressively looking for solutions. We note one management recommendation related to ES&H.

10.2 Recommendation

1. Management at all levels should perform regular, documented safety walks with the intention of identifying leading indicators, and addressing problems.

Action Items

Resulting from the November 13-14, 2003
Department of Energy Review of the

Neutrinos at the Main Injector (NuMI) Project

Action	Responsibility	Due Date
Conduct Semi-Annual Review	DOE/Fermilab	May, 2004

G. Bock
NuMI Project Manager
Fermilab

S. Webster
DOE/NuMI Acting PM
Fermi Area Office

D. Lehman
DOE Review Chairperson
Office of Science

M. Witherell
Director
Fermilab

J. Monhart
Manager
Fermi Area Office

P. Debenham
NuMI Program Manager
Office of Science

Department of Energy Review
of the
Neutrinos at the Main Injector (NuMI) Project

Agenda

Thursday, November 13, 2003 - Comitium

8:00 a.m.	DOE Executive Session	D. Lehmann
9:00 a.m.	Opening Remarks	M. Witherell
9:15 a.m.	Project Overview - Powerpoint, pdf	G. Bock
	Fermilab's Safety Program -- A Journey of Continuous Improvement - Powerpoint, pdf	W. Griffing
	Safety on Service Buildings & Outfitting Project - Powerpoint, pdf	E. McCluskey
10:15 a.m.	Break	
10:30 a.m.	Parallel Discussions	
	Technical Components - WH12NE	
	MINOS - Snakepit (a.m.), Blackhole (p.m.)	
	Installation and Commissioning - WH12NE	
	Civil Construction - 1-North	
	Management - Comitium	
	ES&H - 1-East	
12:00 p.m.	Working Lunch - 2nd Floor Crossover	
12:30 p.m.	Continue Parallel Sessions	
4:30 p.m.	DOE Executive Session	
6:30 p.m.	Adjorn	

Friday, November 14, 2003 - Comitium

8:00 a.m.	Subcommittee Working Sessions	Comitium
10:30 a.m.	DOE Executive Session Closeout Dry Run	Comitium
12:00 p.m.	Working Lunch	2nd Floor Crossover
2:00 p.m.	Closeout Presentation with NuMI Management	1-West
3:00 p.m.	Adjorn	